FORM PTO-1390
(REV 10-97)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

DATE: April 24, 2000

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ATTORNEY DOCKET NO.
37395/DBP

U.S. APPLICATION NO.
(If Known, See 37 CFR 1.5)
09/530145

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/JP98/04702	19.October.1998	24.October.1997

TITLE OF INVENTION
COMMUNICATION GATEWAY DEVICE

APPLICANT(S) FOR DO/EO/US
Toshio Yamawaki

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/LUS).
6. ☒ A translation of the Internat onal Application into English (35 U.S.C. 371(c)(2)).

7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.

8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items below concern other document(s) or other information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Small entity claim with a copy of this transmittal letter attached.
17. ☒ International search report.
18. ☒ International preliminary examination report.
19. ☒ Extra set of Drawings
20. ☒ English Translation of of International Application with English Translation of Annexes to IPER Incorporated
21. ☐

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY DOCKET NO.
To Be Assigned 09/530145	PCT/JP98/04702	37395/DBP

☒ The following fees are submitted: (see Note (1) below)	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-5)):		
Search Report has been prepared by the EPO or JPO ..... **$ 840.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) ... **$ 670.00**		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... **$ 690.00**		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... **$ 970.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) ..... **$ 96.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	**$ 840.00**	
Surcharge of **$130** for furnishing the oath or declaration later than ☐20 ☐30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	9 -20=	0	X $18	$ 0.00	
Independent Claims	6 -3=	3	X $78	$ 234.00	
Multiple dependent claim(s) (if applicable)			+ $260	$ 260.00	
			TOTAL OF ABOVE CALCULATIONS =	$ 1,334.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				$	
			SUBTOTAL =	$ 1,334.00	
Processing fee of **$130** for furnishing the English translation later than ☐20 ☐30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$	
			TOTAL NATIONAL FEE =	$ 1,334.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property				$ 40.00	
			TOTAL FEES ENCLOSED =	$ 1,374.00	
Note (1): The basic national fee must be paid when filing this application. The 20-month time limit (37 CFR § 1.494) and 30-month time limit (37 CFR § 1.495) are not extendable.				Amount to be: refunded	$
				charged	$

a. ☒ A check in the amount of **$ 1,334.00 (filing fee) and $40.00 (recording fee)** to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No._____ in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **03-1728** . A duplicate copy of this sheet is enclosed.

NOTE (2): **Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO

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SFC PAS246100.1-*-4/24/00 11:21 AM

DESCRIPTION

COMMUNICATION GATEWAY DEVICE

TECHNICAL FIELD

The present invention relates to a gateway device that interconnects two communication buses implemented with different communication methods.

BACKGROUND ART

In recent years, in automobiles and other applications, two or more dissimilar communication buses, each handling unique control information, are used. When there is a need to exchange information between one communication bus and another, a gateway device is provided through which the two buses, implemented with different communication methods, are interconnected.

When two communication buses are interconnected via a gateway device as described above, the amount of communication traffic on each communication bus increases because information on one communication bus is transmitted to the other communication bus and vice versa. To suppress such an increase in communication traffic, some prior art gateway devices employ techniques of information filtering using physical addresses or logical addresses, but in that case, information associated with the same address is all transferred to the other communication bus.

Accordingly, with such prior art gateway devices, if only part of information is needed on the communication bus at the receiving side, all information destined for its address is processed for gatewaying into the receiving communication bus. This increases the communication traffic since unnecessary portions of the information are also transferred.

Furthermore, in configurations where periodically occurring information is processed for gatewaying regardless of whether there occurs a change in its contents, the amount of communication traffic also

increases because unnecessary information whose contents remain unchanged is also transferred when only information representing the latest change is needed on the receiving communication bus.

DISCLOSURE OF THE INVENTION

In view of the above problem, it is an object of the present invention to provide a gateway device that processes only really necessary information for gatewaying and thereby avoids unnecessary increases in communication traffic on the communication bus at the receiving side.

To achieve the above object, according to the present invention, there is provided a gateway device, which interconnects two communication buses implemented with different communication methods, comprising: judging means for judging whether or not information received from one communication bus is information that should be transmitted to the other communication bus; and filtering means for transmitting the received information to the other communication bus only when the received information is judged by the judging means to be the information that should be transmitted.

According to the present invention, there is also provided a method of gatewaying, in a gateway device which interconnects two communication buses implemented with different communication methods, comprising the steps of: (a) judging whether or not information received from one communication bus is information that should be transmitted to the other communication bus; and (b) performing filtering to transmit the received information to the other communication bus only when in the step (a) the received information is judged to be the information that should be transmitted.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram showing interconnections between a gateway device, according to the present invention, two communication buses connected by the

gateway device, and devices connected to the respective communication buses.

Figure 2 is a diagram showing in simplified form the format of data transmitted on each communication bus.

Figure 3 is a flowchart illustrating the processing steps of a service routine that a control microcomputer within the gateway device carries out when data is received.

Figure 4 is a diagram showing a table used to judge the contents of received data.

Figure 5 is a diagram showing a table of stored information.

Figure 6 is a flowchart illustrating the processing steps of a service routine that the control microcomputer within the gateway device carries out when a stored information transmission request is received.

BEST MODE FOR CARRYING OUT THE INVENTION

An embodiment of the present invention will be described below with reference to the accompanying drawings.

Figure 1 is a block diagram showing interconnections between a gateway device 10 according to the present invention, two communication buses 20 and 30 connected by the gateway device, and devices connected to the respective communication buses. The devices 21, 22, 23, 24, etc. connected to the communication bus A as the first communication bus 20 perform communications with one another in accordance with a communication protocol A (a set of communication rules) as a first communication method. Likewise, the devices 31, 32, 33, 34, etc. connected to the communication bus B as the second communication bus 30 perform communications with one another in accordance with a communication protocol B as a second communication method.

The gateway device 10, which interconnects the communication bus A 20 and the communication bus B 30, comprises an interface 11 for interfacing with the

communication bus A, an interface 12 for interfacing with the communication bus B, a memory 13, and a microcomputer 14, and accomplishes the function of receiving data from one communication bus and transmitting the data to the other communication bus by performing protocol conversion.

The embodiment here specifically assumes the case in which the invention is applied to an automobile, and the communication bus A 20 is configured as a bus that uses a protocol intended for data communications between vehicle body-related control devices, while the communication bus B 30 is configured as a bus that uses a protocol intended for data communications between status information-related control devices. An engine ECU (electronic control unit) as the device 21, an air-conditioner ECU as the device 22, a meter ECU as the device 23, etc. are connected to the communication bus A 20. To the communication bus B 30 are connected a display ECU as the device 31, a navigation ECU as the device 32, an audio ECU as the device 33, etc.

Figure 2 is a diagram showing in simplified form the format of data transmitted on each communication bus. As shown in the diagram, the data consists of a header and a message, and the message is made up of a command and a parameter accompanying the command. The command is expressed by a 1-byte code. The header contains an address, an attribute, etc. The data format on the communication bus A 20 and the data format on the communication bus B 30 are fundamentally the same as that shown in Figure 2; however, the details differ between the two formats, and the conversion between them is accomplished by the gateway device 10.

Figure 3 is a flowchart illustrating the processing steps of a service routine that the control microcomputer 14 within the gateway device 10 carries out when data is received. Figures 4 and 5 are diagrams showing in schematic form the contents of tables held in the memory

13 and used during the processing of Figure 3. This routine can be carried out not only when gatewaying from the communication bus A 20 to the communication bus B 30 but also when gatewaying from the communication bus B 30 to the communication bus A 20. The following description deals with the gatewaying from the communication bus A 20 to the communication bus B 30.

First, in step 102, the contents of the received data are examined to judge whether the data concerns a command that does not need gatewaying or information that should be gatewayed only when there is a change in the contents or as it is received, regardless of whether a change has occurred or not.

This judgement is made based on the command code contained in the data, and a table such as shown in Table 4 is prestored in the memory 13 for this purpose. The table has a column indicating the command type for each command code. For example, the engine ECU 21 periodically transmits an engine rpm display command expressed by a command code $(1F)_{16}$ (meaning the hexadecimal number 1F); this and other commands indicted by the command type "0" are commands that do not need gatewaying. On the other hand, the air-conditioner ECU 22 periodically transmits an outside temperature display command expressed by a command code $(05)_{16}$; this and other commands indicated by the command type "1" are commands that should be gatewayed only when there is a change in the contents. Further, the meter ECU 23 transmits a distance-to-empty display command expressed by a command code $(B3)_{16}$ and an instantaneous fuel economy display command expressed by a command code $(DE)_{16}$; these and other commands indicted by the command type "2" are commands that should be gatewayed as they are received, regardless of whether a change has occurred or not.

If it is judged in step 102 that the command is a command, such as the engine rpm display command, that

does not need gatewaying, the routine is terminated without performing processing for gatewaying. This serves to prevent the increase in traffic that would occur on the data receiving communication bus if the processing for gatewaying were performed.

If it is judged in step 102 that the command is a command, such as the outside temperature display command, that should be gatewayed only when there is a change in data contents, the process proceeds to step 104. In step 104, a table such as shown in Figure 5 is referenced. This table stores the latest data of information that should be stored. In step 104, the outside temperature data stored in the table, for example, is compared with the value of the outside temperature expressed by the currently received outside temperature display command, to determine whether there is a change in the contents. If it is determined that there is no change, the routine is terminated without performing processing for gatewaying. In this case also, the increase in traffic that would occur on the data receiving communication bus if the processing for gatewaying were performed can be prevented. On the other hand, if it is determined in step 104 that there is a change, the process proceeds to step 108 where the contents of the currently received data are stored as the latest data in the corresponding area of the table of Figure 5. Then, the process proceeds to step 110 to perform processing for gatewaying.

If it is judged in step 102 that the contents of the data show information, such as the distance-to-empty display command or the instantaneous fuel economy display command, that should be gatewayed as it is received, the process proceeds to step 106. In step 106, it is judged whether the received data carries information that should always be output via the gateway upon a request from the communication bus. A stored flag column in the table of Figure 4 is reference for this judgement. For example, a

command whose stored flag is "1", like the distance-to-empty display command, is a command that should always be output via the gateway upon a request from the communication bus; on the other hand, a command whose stored flag is "0", like the instantaneous fuel economy display command, does not fall into the above command category. If the result of the judgement in step 106 is YES, the previously described storing processing of step 108 and the gateway processing of step 110 are carried out before terminating the routine. On the other hand, if the result of the judgement in step 106 is NO, only the gateway processing of step 110 is carried out before terminating the routine.

Figure 6 shows the processing steps of a service routine carried out by the control microcomputer 14 when the gateway device has received a stored information transmission request from the communication bus. First, in step 202, it is determined whether the requested information is stored in the stored information table (Figure 5) within the memory 13. For example, when the result of the determination is YES, like the case when a request for the distance-to-empty data is made from the communication bus B 30, the process proceeds to step 204 where the requested stored information is processed for gatewaying to the requesting communication bus, after which the routine is terminated. On the other hand, when the result of the determination is NO, the process proceeds to step 206 to notify the requesting communication bus that the requested information is not stored in the stored information table (Figure 5) within the memory 13, after which the routine is terminated.

In cases where a device connected to the receiving communication bus has failed to capture the information transmitted through the gateway or the information has been erased by a reset operation, etc., if the processing such as shown in Figure 6 is provided there is no need to have the transmitting communication bus re-transmit the

information, but the gateway information can be acquired from the gateway device any time.

Trial calculations were made to see how much the increase in traffic can be suppressed when the present invention is employed. First, it was assumed that the communication bus A has a transfer speed of 10 kbps, and that the bus usage by itself is 60% and the maximum allowable bus usage is set to 90%. It was also assumed that the communication bus B has a transfer speed of 17 kbps, and that the bus usage by itself is 30% and the maximum allowable bus usage is set to 40%.

Considering the case where the communication buses A and B are interconnected and gatewaying is performed from the communication bus A to the communication bus B, it is assumed that the gatewaying entails a factor of 1.7 increase in loss because of the addition of additional information, etc. associated with protocol conversion.

Supposing that 20% of the information on the communication bus A flows into the communication bus B by the gatewaying of the prior art, the bus usage on the communication bus B rises to

$$30\% + 60\% \times 20\% \times 1.7 = 50.4\%$$

and thus cannot be held within the maximum allowable bus usage 40% for the communication bus B.

On the other hand, supposing that the percentage of the information on the communication bus A that flows into the communication bus B is held down to 5% because of the filtering effect of the gateway device according to the present invention, the bus usage on the communication bus B is then

$$30\% + 60\% \times 5\% \times 1.7 = 35.1\%$$

and can thus be held below the maximum allowable bus usage 40% for the communication bus B.

As described above, according to the present invention, by processing only really necessary information for gatewaying, it becomes possible to

prevent unnecessary increases in communication traffic on the communication bus to which the data is sent through the gateway.

What is claimed is:

1. (Amended) A gateway device which interconnects two communication buses implemented with different communication methods, and in which information to be communicated is made up of a header field containing information such as an address necessary for communication and a message field containing information to be used at receiving side after the communication based on said header field is completed, said gateway device comprising:

judging means for judging, based on contents of said message field, whether or not the information received from one communication bus is information that should be transmitted to the other communication bus; and

filtering means for transmitting said received information to said other communication bus when said received information is judged by said judging means to be the information that should be transmitted.

2. (Amended) A gateway device which interconnects two communication buses implemented with different communication methods, and in which information to be communicated is made up of a header field containing information such as an address necessary for communication and a message field containing a command and a parameter accompanying said command, said gateway device comprising:

judging means for judging, based on said command, whether or not the information received from one communication bus is information that should be transmitted to the other communication bus; and

filtering means for transmitting said received information to said other communication bus when said received information is judged by said judging means to be the information that should be transmitted.

3. (Amended) A gateway device which interconnects two communication buses implemented with different

communication methods, comprising:

judging means for judging whether or not information received from one communication bus is information that should be transmitted to the other communication bus;

storage means for storing the information that is judged by said judging means to be the information that should be transmitted; and

filtering means for comparing the information stored in said storage means with newly received information which is of the same kind as said stored information and is judged by said judging means to be the information that should be transmitted and, when their contents differ, transmitting said received information to said other communication bus while, at the same time, storing said received information in said storage means.

4. A gateway device as claimed in claim 3, further comprising:

means for transmitting the information stored in said storage means to said communication bus in accordance with a request made from said communication bus.

5. A gateway device as claimed in any one of

claims 1 to 4, wherein said gateway device interconnects two communication buses in an automobile.

6. (Amended) A method of gatewaying in a gateway device which interconnects two communication buses implemented with different communication methods, and in which information to be communicated is made up of a header field containing information such as an address necessary for communication and a message field containing information to be used at receiving side after the communication based on said header field is completed, said method of gatewaying comprising the steps of:

(a) judging, based on contents of the message field of said communication data, whether or not the information received from one communication bus is the information that should be transmitted to the other communication bus; and

(b) performing filtering to transmit said received information to said other communication bus when in said step (a) said received information is judged to be the information that should be transmitted.

7. (Amended) A method of gatewaying in a gateway device which interconnects two communication buses implemented with different communication methods, and in which information to be communicated is made up of a header field containing information such as an address necessary for communication and a message field containing a command and a parameter accompanying said command, said method of gatewaying comprising the steps of:

(a) judging, based on the command contained in the message field of said communication data, whether or not the information received from one communication bus is the information that should be transmitted to the other communication bus; and

(b) performing filtering to transmit said

received information to said other communication bus when in said step (a) said received information is judged to be the information that should be transmitted.

8. (Amended) A method of gatewaying in a gateway device which interconnects two communication buses implemented with different communication methods, comprising the steps of:

(a) judging whether or not information received from one communication bus is information that should be transmitted to the other communication bus;

(b) storing the information that is judged in said step (a) to be the information that should be transmitted; and

(c) performing filtering whereby the information stored in said step (b) is compared with newly received information which is of the same kind as said stored information and is judged in said step (a) to be the information that should be transmitted and, when their contents differ, said received information is transmitted to said other communication bus while, at the same time, storing said received information in said step (b).

9. (Amended) A method of gatewaying as claimed in claim 8, further comprising the step of:

(d) transmitting the information stored in said step (b) to said communication bus in accordance with a request made from said communication bus.

ABSTRACT

A gateway device is disclosed which processes only really necessary information for gatewaying and thereby prevents unnecessary increases in communication traffic on a communication bus to which data is sent through the gatewaying. When it is judged that the contents of received data concern a command that does not need gatewaying, the processing for gatewaying is inhibited. When it is judged that the contents of the received data show information that should be processed for gatewaying only when there is a change in the contents, the contents are compared with the latest contents of the same kind of information stored in a memory, to determine whether there is a change in the contents, and the processing for gatewaying is inhibited when it is determined that there is no change.

Fig.1

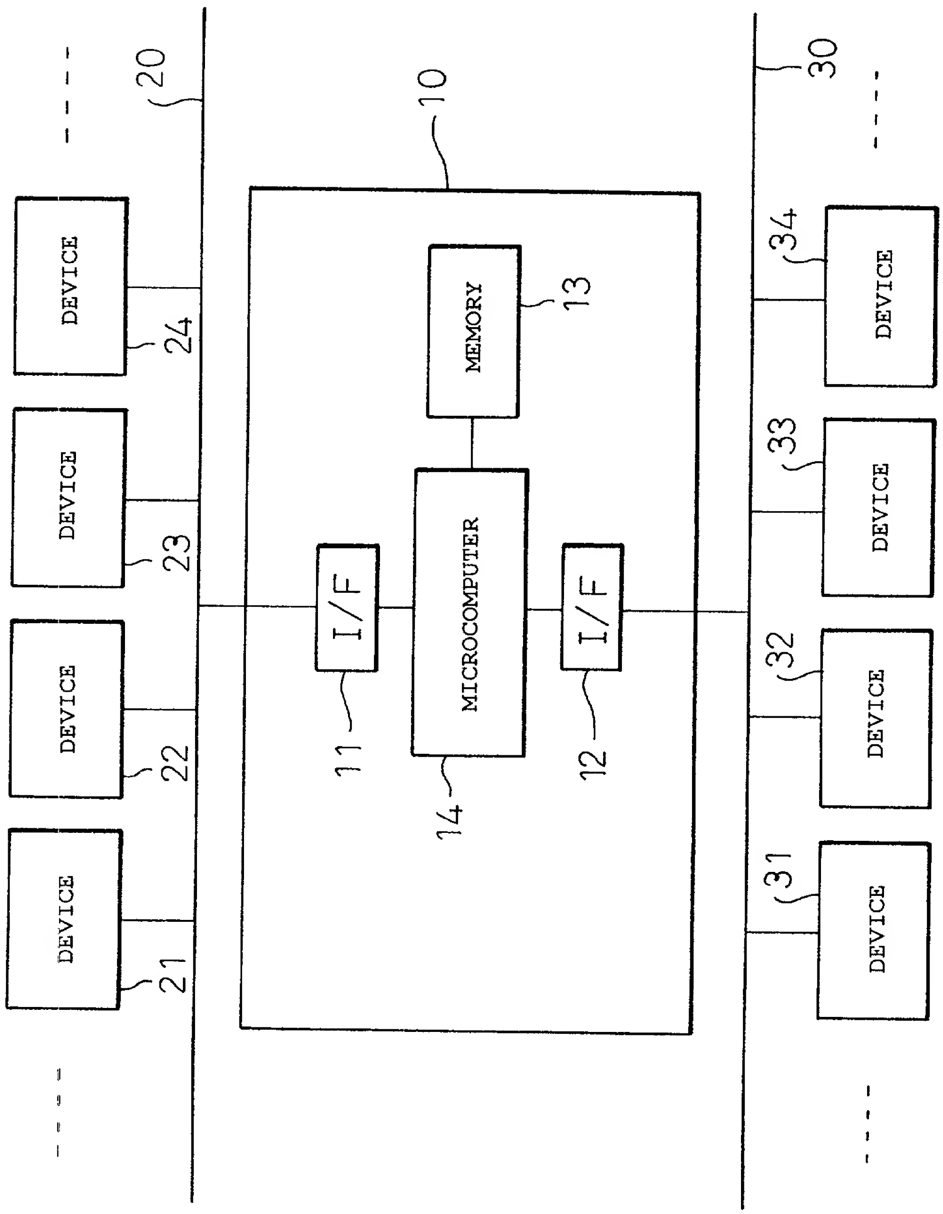

DEVICE
DEVICE
DEVICE
DEVICE
21
22
23
24
20
10
MEMORY
13
MICROCOMPUTER
14
I/F
11
I/F
12
30
DEVICE
DEVICE
DEVICE
DEVICE
31
32
33
34

Fig. 2

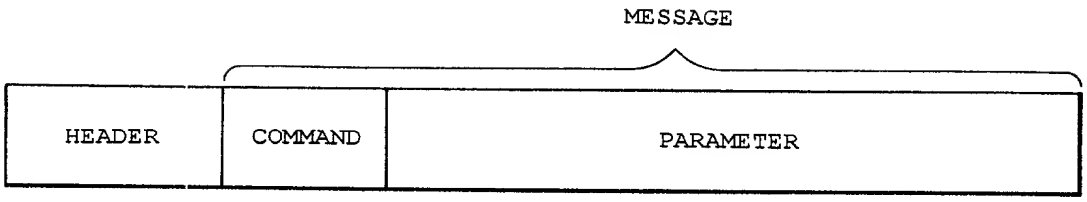


Fig. 3

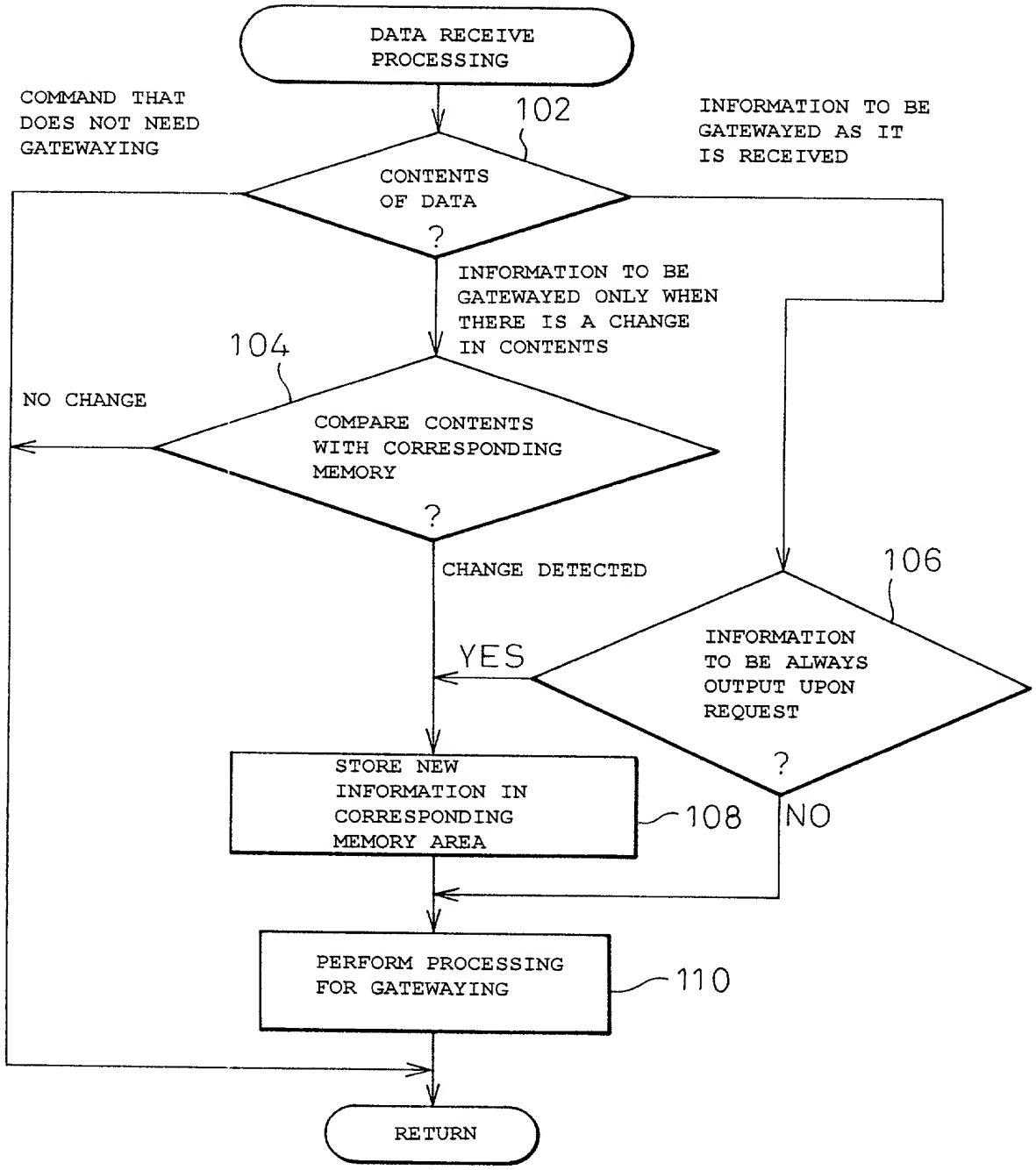

DATA RECEIVE PROCESSING
COMMAND THAT DOES NOT NEED GATEWAYING
102
INFORMATION TO BE GATEWAYED AS IT IS RECEIVED
CONTENTS OF DATA
?
INFORMATION TO BE GATEWAYED ONLY WHEN THERE IS A CHANGE IN CONTENTS
104
NO CHANGE
COMPARE CONTENTS WITH CORRESPONDING MEMORY
?
CHANGE DETECTED
106
YES
INFORMATION TO BE ALWAYS OUTPUT UPON REQUEST
?
NO
STORE NEW INFORMATION IN CORRESPONDING MEMORY AREA
108
PERFORM PROCESSING FOR GATEWAYING
110
RETURN

Fig. 4

COMMAND CODE (HEX)	COMMAND TYPE	STORED FLAG
⋮	⋮	⋮
"05" (OUTSIDE TEMPERATURE)	1	1
⋮	⋮	⋮
"1F" (ENGINE RPM)	0	0
⋮	⋮	⋮
"B3" (DISTANCE-TO-EMPTY)	2	1
⋮	⋮	⋮
"DE" (INSTANTANEOUS FUEL ECONOMY)	2	0
⋮	⋮	⋮

Fig. 5

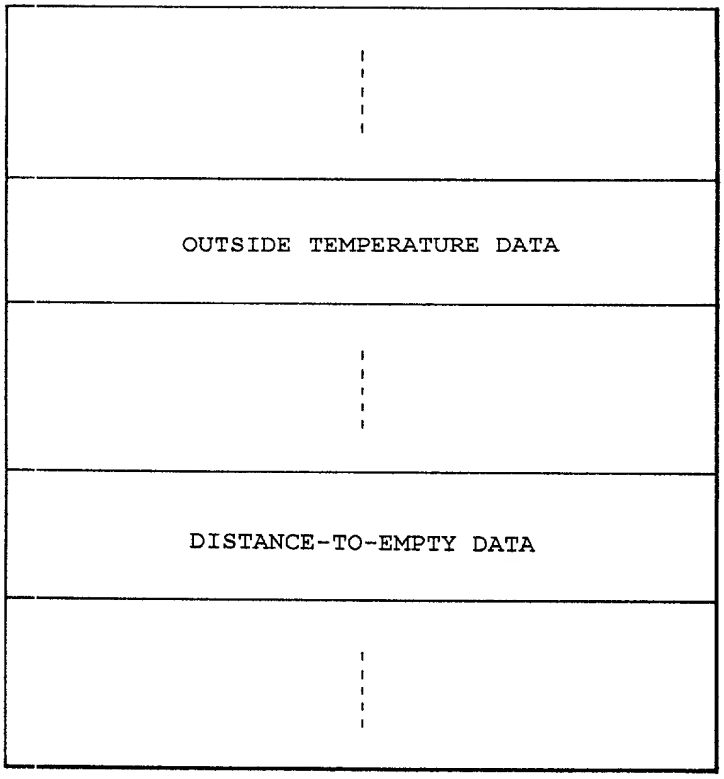
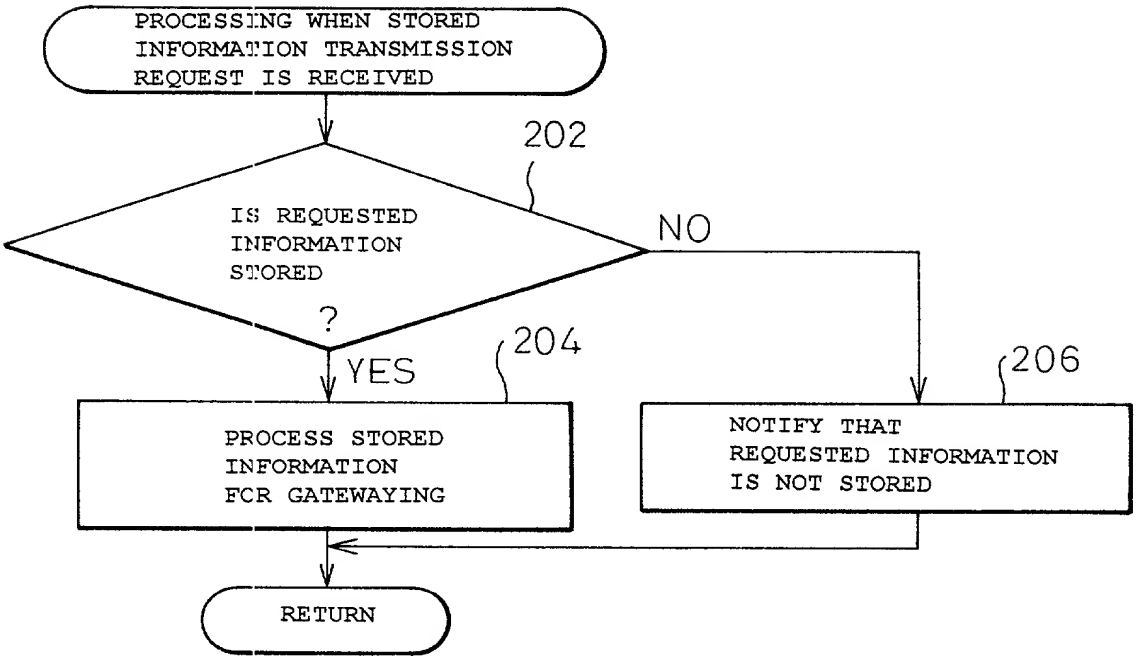


Fig. 6


PROCESSING WHEN STORED INFORMATION TRANSMISSION REQUEST IS RECEIVED
202
IS REQUESTED INFORMATION STORED ?
NO
YES
204
206
PROCESS STORED INFORMATION FOR GATEWAYING
NOTIFY THAT REQUESTED INFORMATION IS NOT STORED
RETURN

PTO/SB/106 (8-96)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

☐ 下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者である（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

COMMUNICATION GATEWAY DEVICE

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ __月__日に提出され、米国出願番号または特許協定条約国際出願番号を_____とし、
（該当する場合）_____ に訂正されました。

☐ was filed on October 19, 1998
as United States Application Number or
PCT International Application Number
PCT/JP98/04702 and was amended on
August 27, 1999 (if applicable).
(Under PCT Art. 34)

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第３７編第１条５６項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

PTO/SB/106 (8-96)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Japanese Language Declaration
(日本語宣言書)

私は、米国法典第３５編１１９条(a)-(d)項又は３６５条(b)項に基き下記の、米国以外の国の少なくとも一カ国を指定している特許協力条約３６５(a)項に基ずく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)
外国での先行出願

(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	Priority Not Claimed 優先権主張なし
9-292909(Pat. Appln.)	Japan	24/October/1997	☐
			☐

私は、第３５編米国法典１１９条(e)項に基いて下記の米国特許出願規定に記載された権利をここに主張いたします。

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)	(Application No.) (出願番号)	(Filing Date) (出願日)

私は、下記の米国法典第３５編１２０条に基いて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約３６５条(c)に基ずく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第３５編１１２条第１項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第３７編１条５６項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況：特許許可済、係属中、放棄済)

私は、私自身の知識に基ずいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じるところに基ずく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第１８編第１００１条に基ずき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに下記のごとく宣誓を致します。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

PTO/SB/106 (8-96)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Japanese Language Declaration
(日本語宣言書)

委任状： 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。（弁護士、または代理人の氏名及び登録番号を明記のこと）

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith *(list name and registration number)*

Please see attachment

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私書箱		Post Office Address

（第三以降の共同発明者についても同様に記載し、署名をすること）

(Supply similar information and signature for third and subsequent joint inventors.)

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ATTACHMENT TO PAGE 3
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